N92-13123

ROENTGENSATELLIT
(ROSAT)

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NOPE: T. Howe	MOM:	F. Guckenbiehl (GSOC)
	LV/Range:	Delta II/CCAFS

Launch Date: June 1, 1990
Projected SC Life/DSN Support: 18 months/18 months

Project Responsibility: Goddard Space Flight Center (BMFT Cooperative)

Source: Project Plan (GSFC), dated October 1983, and other project documents
Sponsor: OSO

A.   MISSION DESCRIPTION

The ROSAT is an international cooperative program between the National Aeronautics and Space Administration (NASA) and the Bundesministerium fuer Forschung and Technologie (BMFT) of the Federal Republic of Germany. Germany will develop and provide a spacecraft with an X-ray telescope featuring two instruments at the focal plane of the telescope, and a stand-alone Wide Field X-ray Camera (WFC) provided by the United Kingdom (U.K.). NASA will provide one instrument: a High Resolution X-ray Imager (HRI) for mounting in the focal plane similar to the High Energy Astronomy Observatory (HEAO)-2 HRI. NASA launched the satellite on a Delta II vehicle in June 1990.

ROSAT will make an all-sky survey of X-ray and extreme ultraviolet (EUV) sources, using redundant German Position Sensitive Proportional Counters (PSPCs) and the British WFC during the first six months of its orbital mission while in a scan mode. The next 12 months will be dedicated to detailed measurements of selected X-ray sources employing the U.S. HRI, the German PSPC, and the U.K WFC in a stationary or pointing mode of spacecraft operation.

In the scan mode, the spacecraft will maintain the telescope axis approximately normal to the Earth (i.e., one spacecraft rotation per orbit). In the pointing mode, the spacecraft will be three-axis stabilized with the telescope pointing to a particular X-ray source for long periods of time (10^3 to 10^4 seconds).

A Memorandum of Understanding (MOU) setting forth the international agreement between NASA and the BMFT for the joint accomplishment of the ROSAT program was signed on August 8, 1982.

B.   FLIGHT PROFILE

The ROSAT was launched from the Cape Canaveral Air Force Station on a Delta 2 expendable launch vehicle and placed in a circular orbit at an altitude of 580 km, with a 53-deg inclination.

C.   COVERAGE

1.   Coverage Goals

The support planned by the DSN for ROSAT is provided in the following table:

Mission Phase	Period	Passes per Month	Antennas
Launch and S/C checkout	6/90	60	26m
DSN Emergency Support Phase	6/90 - 12/92	3	26m

2.   Network Support

The DSN will provide prime support from spacecraft release from the Delta II through L + 28 days. The DSN will provide backup support to Weilheim for the duration of the mission. This support will normally be provided by the DSN 26-meter stations, and will only be provided as specifically required by the project, German Space Operations Center. The support provided by the DSN is indicated in the following table:

System	Goldstone	Canberra	Madrid
	12 14 15 16	42 43 45 46	61 63 66
S-band TLM	P/B	P/B	P/B
S-band CMD	P/B	P/B	P/B
S-band TRK	P/B	P/B	P/B

NOTE: P/B = Prime or backup depending on mission phase

D.   FREQUENCY ASSIGNMENTS

The uplink and downlink frequencies are listed below:

Uplink : 2096.27 MHz
Downlink: 2276.50 MHz (RCP or LCP)

E.   SUPPORT PARAMETERS

The support parameters for the Telemetry and Command Systems are listed below:

(1)   Telemetry

Data Streams: 2 (8 kb/s only supported by DSN)

Modulation : PCM/BIØL/PM
Subcarrier : None (Directly on Carrier)
Bit Rates   : 8 kb/s by DSN
               1 Mb/s science data supported only by Weilhelm

(2)   Command

Modulation : PCM/PSK/PM
Subcarrier Frequency: 16 kHz
Bit Rate   : 1 kb/s

F.   TRACKING SUPPORT RESPONSIBILITY

The allocation of responsibilities for tracking support is listed in the following table:

Mission Phase	Support Responsibility
Delta II Launch to Orbit	GSFC
Prime Spacecraft Mission Support	Weilheim/DSN*
Backup Spacecraft Mission Support	DSN

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*Selected prime support for the first four weeks after launch.

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